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Legislation for the Adirondacks.

THERE are several bills relating to the Adirondacks now before the Legislature at Albany, which propose radical changes in the character of the forest reserve and its administration. The recommendation of the Governor that a Commission of five men be empowered to fix the bounderies of a "state park" consisting of from 2,500 to 5,000 square miles, seems to meet with little favor, and a bill presented by the Speaker of the House, and embodying in the main the Governor's plan, has been practically withdrawn. Another bill, authorizing the establishment of such a reservation under the direction of certain citizens named in the bill, has been presented in the Assembly, but it will probably fail.

At this time it seems probable that Senator Sloan's report on the Governor's plan, which has already passed the Senate, will be concurred in by the House. This resolution empowers the present Adirondack Commission to consider the project of a so-called park to include the lands about the head-waters of the main streams which take their rise in the wilderness, and report on its size, location and probable cost. It is evident that there is no salvation for the woods unless the state acquires absolute title to them, and preparation for such purchase should be made without delay, but it should be remembered that ownership by the state in fee simple is not of itself a guarantee that the wilderness will be safe. One of the proposed park bills, for example, contemplates the leasing of its lands by the state in lots of twenty-five acres, and this provision would mean absolute ruin to the forest.

No legislation will be satisfactory unless it is based on the principle that the first and only sufficient reason why the state should hold a great tract of land within its borders is that it is essential that this particular region should remain forest-covered always so that the flow of the great water-ways of the state need not be impaired. The ruin of the Adirondack forests means the ruin of our rivers, and it is impossible to secure the preservation of the forests for all time unless they are controlled by the state working under a permanent policy. All other questions regarding the North Woods are unimportant in comparison with that relating to the water supply. It is very well to have a sanitarium, and it is proper that people should be able to enjoy the refreshing contact with wild nature; but, after all, these are secondary considerations.

Again, if the forest is to remain and reproduce itself for all time, the fewer people who live within its borders, besides its custodians, the better. If the state acquires a large area it will be necessary, of course, to establish, at convenient points, public houses for the protection and entertainment of visitors. But this is a different thing from leasing the state land to individuals. If one man is entitled to a good site on a lake-shore for a fancy camp or a summer villa, the privilege cannot be denied to his neighbor without injustice. No matter how wild and picturesque these people intend their summer homes to be. Each one clears a little and burns a little more, and the forest, as a forest, is doomed. It is only necessary to examine the neighborhood of Paul Smith's to learn what settlement in the forest can accomplish in a very short time.

The two immediate dangers which threaten the North Woods are (1) the extension of railroads into the wilderness, for a railroad through a forest means its extermination; and (2) the legalized use of the woods as the summer homes of wealthy men. Any enactment which does not recognize and guard against these dangers will fail to accomplish its highest purpose.

The hard pine of the south, although the supply has generally been regarded as practically inexhaustible, as the supply of white pine was considered inexhaustible a few years ago, seems to be in danger of exhaustion much more rapidly than was supposed possible ten years ago. The demand for lumber of this description is increasing all over the world, and more and more of our hard pine is sent every year to Europe, South America and Australia, while the home consumption is doubling every few years. The saw-mills of the Southern Pine-belt are now kept running to their utmost capacity, and new mills are projected in all directions. The amount of this lumber exported last year from the United States exceeded the amount exported during the previous year by about forty per cent., while Great Britain took an excess of more than fifty per cent. over her importations of the previous year. It is believed that the output of the hard pine mills will be this year much greater than it was last, and that prices are to be considerably higher.

There is still a very large amount of this timber left standing in the Pine forests which extend along the coast from North Carolina to Texas; and there are still regions in which the sound of the axe is still practically unknown. The southern pine forests, however, are encroached on more seriously every year by the manufacturers of turpentine, who destroy a vast amount of timber with very little profit to themselves. But the real danger in the situation is that these forests of Pine are nowheres reproducing themselves. It is the custom, dating from before the time of the coming of Europeans to America, to burn over every spring the whole territory covered by these forests for the purpose of improving the scanty pasturage which is found among the trees, and this burning, renewed year after year, has destroyed all seedling trees, and so changed and deteriorated the character of the soil that it cannot produce again timber of commercial value. The situation is briefly this: The consumption of hard pine is increasing in a remarkable and unexampled manner. Reproduction is at a standstill. It can only be a matter of time, therefore, when the commercial importance of the Pine-forests of the south, which once contained, and perhaps still contain, the greatest body of accessible building timber of the very highest class the human race has ever seen, will be a thing of the past. No

other Pine forests produce such valuable material, and it is not very evident where the world is to find a substitute for our southern hard pine.

The number of books which have been written on the art of landscape-gardening since the arrangement of gardens and of pleasure-grounds was elevated by the poets of the seventeenth and eighteenth centuries to the rank of a fine art appears surprisingly small, when the attention to everything relating to country life, especially in England during the last two hundred years, is remembered. It is not less surprising that this literature is so generally overlooked, and so little known by the very persons who would be expected to be most interested in it, and that no serious effort has yet been made by any of the great libraries to form a complete collection of books relating to the history and arrangement of gardens. There is, however, a re-awakening of interest in the landscape-gardening art, especially in this country, where there is now every indication that its principles are to be more generally applied than they have ever been before, not only in the construction of the parks and pleasure-grounds which are springing into existence in the neighborhood of all the great centres of population in the United States, but in the more prosaic, but not less useful, arrangement of towns and villages, to which the trained landscape-gardener can bring the health, convenience and beauty which will add so much to the material welfare and development of the American people. As the knowledge of the art increases and the importance of its relations to a civilized people comes to be more generally understood, the interest in this literature, which contains a few works of cardinal value, and several of great mechanical beauty, will increase. It is desirable, therefore, that as complete collections of these books as it is possible to secure should be found on the shelves of our principal libraries, that those who practice the art, and those who study its principles, may have it within their power to learn all that books can teach them on the subject. With this view in mind, and for the purpose of aiding librarians in a search for books relating to the garden, we have obtained the permission of a correspondent to print the list of publications which have appeared on the art of landscape-gardening since Bacon first defined its scope and aims. The list has been prepared under exceptionally favorable circumstances, and is much fuller and more complete than any bibliography of the subject which has appeared. That it is not complete, however, there is probably little doubt, and corrections and extensions are asked for, in the interest of fuller information upon a subject of much literary and artistic importance.

Some Old American Country-Seats.—IV.

CLERMONT.

NEW ENGLAND, in the old days before the growing up of the great cities, possessed many towns in and near which dwelt people of polite cultivation and polished manners, whose sober, but often stately, mansions yet remain. In the seaboard towns especially, such as Portsmouth, Newburyport, Salem and New Bedford, still stand numerous examples of this appropriate urban architecture, substantial buildings, with light and some space about them, and sometimes a court-yard enclosed by a high wall in the English fashion. At Kittery, at New Bedford and elsewhere, not to speak of numerous, but fast disappearing, examples near Boston, mansions of this character may be seen standing well out of town in small parks of their own. It should be noted that the three old Bostonian country-seats, already described in this series of brief papers, have been chosen only because of their exhibiting more than usual breadth of landscape-setting, combined with more than usual excellence of general design.

Passing now from New England to New York, from the region of small hills and ponds and streams which surrounds Boston to the prospect-commanding banks of the broad Hudson, and again selecting ancient country-seats which excel in point of design, we come first to Montgomery Place, at Barrytown.

Barrytown is itself but a very small village, about ninety miles from New York and some fifty from Albany, and it is so surprising to find here an old seat of the first class, that this number of the series must be devoted to an explanation of the fact. The Hudson River naturally attracted settlers very early. The Dutch established a trading-post at Beaverwyck even before they built their fort of New Amsterdam, and here the Van Rensselaers held sway as Patroons during many years. After the English gained possession of the country, and renamed the chief towns New York and Albany, the river-lands began to be parceled out among such persons as applied for them and could persuade the Indians to sell their hunting-grounds for coats, hatchets or beads. Among others who thus obtained a manor was Robert Livingston, an immigrant of 1674, son of a clergyman who had been exiled to Holland for non-conformity. This gentleman married the widow of the Patroon, and was made lord of the manor of Livingston in 1685 by Governor Dongan, who granted him title to 150,000 acres with a frontage of about fifteen miles on the east bank of the Hudson River, opposite the Catskill Mountains. After a younger son of his, also named Robert, had distinguished himself by frustrating an Indian plot, he set off the southern part of his ample domain beside the river, and gave it to this son, making him lord of a new manor, which he named Clermont. The Clermont manor-house stands intact, its stout walls having survived the fire set by British raiders just before Burgoyne surrendered in 1777. It is approached by a long winding road, which descends from the highway through a wild woodland. Near the house the road divides to send a branch to the kitchen-door and to the stable, and the main road ends with a turn placed most unfortunately between the house and the river. The house is a square building with two low wings, and stands on a natural terrace within half a stone's throw of the low bluff which here makes the river's shore. Immediately behind it rises a bank of forest-trees, the edge of Clermont Woods, and before it, in an irregular row on the brink of the bluff, stand a dozen huge Locust-trees, doubtless the ancestors of many others which adorn the numerous Livingston properties along the river. One of these great trunks measures six yards in circumference, and shows to this day the marks of British cannon-shot.

From Clermont a short walk southward through an avenue of tall and crowded Locusts brings one to another and more elaborate mansion, situated upon the same natural terrace, backed by the same hanging woods, and commanding the same view of the river and the Catskills. This house was built by that Robert R. Livingston who was a delegate from New York to the Congress of 1776, and became first Chancellor of the State of New York, Minister to France and a patron of Robert Fulton. The ground plan of his house is in the form of an H. The central hall in the middle of the H is entered from either court; and a long corridor, which looks on the river court, and is hung with family portraits, connects the drawing-room in one wing with the dining-room in the other. The external walls of the house are white, the great rooms in the low wings have long windows opening nearly to the ground, and the two stories of the central block are crowned by an elaborate white railing. Across the ends of the wings and the river court extends a platform at which carriages may draw up, and a carriage-road makes a rectangle about the whole house. A more interesting example of domestic architecture in the formal style does not exist in America. Its owners, men who were conspicuous in the political struggles of the young Republic, were often compelled to make the long journey to New York; but they always returned to Clermont as to their one permanent home—so strong, even after manorial privileges had been abandoned, was their old English liking for country-life and country-leisure. Montgomery Place, at Barrytown, was an offshoot of these manorial seats at Clermont. Like several other old seats upon the Hudson, it would never have been created had not Governor Dongan and his superiors in England attempted to plant in America the English manorial system.

Boston, Mass. *Charles Eliot.*

The California University Gardens.

ALTHOUGH the careful and constant work of Professor Hilgard and his assistants has created what is already, in important respects, a "Botanic Garden," it is modestly divided, in his reports, into the "Agricultural Grounds," the "Experimental Grounds" and the "Garden of Economic Plants." Berkeley, although exposed to the sea winds, is high above the valley, and much has been done to naturalize a great variety of plants there which are popularly supposed to thrive only in the southern counties of the state.

When the site for the University of California was to be

chosen many considerations were involved. There were valleys, east of the Coast Range, warm and well watered, that offered magnificent situations, but they were too far from San Francisco, the commercial centre. Berkeley, fronting the Golden Gate, with the Contra Costa Mountains behind it, combined the greatest number of advantages. Here, too, small but beautiful streams, flowing from deep, rocky and wooded cañons, united at the edge of the valley; here were copses of Laurel and Alder, and noble groups of Sycamore Maple and Live Oak; here was a large extent of rolling upland, sloping to the bay on the west, and rising on the east into rugged mountains. Every botanist and landscape-gardener who saw the place was charmed with its possibilities. Frederick Law Olmstead was asked to make a plan for the University grounds and the adjacent town. This plan was subsequently stolen or destroyed, and every effort to secure capable landscape-gardening was for some time frustrated. A man who had millions of *Eucalyptus globulus* seedlings managed to sell several hundred thousand of them to the University authorities, and they were planted everywhere. Instead of the garden art that every educated Californian wanted to see, Berkeley became for years a wilderness of tall, crowded Eucalypti, and all its natural beauties were obscured. A broad avenue winding about the base of the hills for miles, which had appeared in Mr. Olmstead's plan, was almost entirely lost. Even the town yielded to the prevailing Eucalyptus craze, and soon rivaled the University in its stiffness.

The great Oaks were still left below the University building and along Strawberry Creek, and, ten years later, as wiser counsels prevailed, the Eucalypti were thinned out and left for a background and for occasional masses on the hills. Part of the warmest ravine and plateau south of the main creek had been sold, unwisely, and against the advice of those who wished to see a botanic garden established. But at the north side of the University tract was a low hill-slope, with southern exposure, and a few acres of rich bottom-land along the creek below. Here propagation houses were built, and the long task of substituting valuable and beautiful plants for the foolish monotony of surplus Eucalyptus-trees was begun by the Agricultural Department.

The evil of the past is now nearly obliterated. English and other Oaks form one plantation. Some of the most beautiful Australian Acacias are grouped among the California conifers. Sheltered south of a belt of Live Oaks are Palms in great variety, and there are great masses of Bamboos. The experimental orchard and vineyard are on a hill-slope, with the economic garden south-west on the plain. Steadily, persistently, the work of covering the hundred or more acres of available land with rare and valuable plants goes on under Professor Hilgard's supervision.

My own memories of the University gardens go back to 1876, when I used to spend Saturday afternoons in the plant-houses helping a good-natured gardener, and taking my pay in seeds and cuttings of whatever happened to strike my fancy. It was an amateur sort of a place in those days, however, with very little that the florists did not have, and no system worth mentioning. The most brilliant event of that decade was to plant thousands of white and red Mesembryanthemums on the hot hill-slopes and around the University buildings, which the irreverent students presently named "Faculty Onions," and laughed to scorn, rightly preferring turf, or even Wild Oats.

By 1880, after the work of propagation had been well systematized under the direct supervision of Mr. W G. Klee, a great many valuable trees and shrubs were distributed over California besides the specimens that found place in the grounds. Among them were five species of Cinchona—*C. Calisaya*, *C. succirubra*, *C. condaminea*, *C. officinalis* and a hybrid from India.

The winter of 1887–88 killed all the Cinchonas, although *C. officinalis* and the hybrid had withstood all former winters by means of slight protection, and were nearly ready to bloom. All the distributed trees, excepting those at Mrs. Whitney's, San Diego, also died. The regions in this state adapted to this tree are evidently limited. The warmest mesa lands of the extreme southern part of the state promise a moderate success.

The Carob (*Ceratonia Siliqua*) is quite hardy, as is also the Caper (*Capparis spinosa*). The Japan Vegetable Wax (*Rhus succedanea*), also *R. vernicifera*, are free growers and ornamental, and, with the *R. Coriaria*, perfectly adapted to California. *Anona muricata*, the Sour Sop, was a failure, and *A. Cherimolya*, only suited to greenhouse culture at Berkeley, thrives in the southern parts of the state. The Tamarind-tree is very tender and a slow grower. Among other trees planted and doing well are the *Argania Sideroxylon* of north Africa, and the *Berberis heteropoda* of Turkistan.

The experiments with Oaks deserve especial attention. The eastern species, such as *Quercus nigra*, *Q. coccinea*, *Q. alba* and others, are slow growers. The English *Q. Robur* is a great success, surpassing in rapidity of growth all other sorts two or three times over. Acorns planted in 1878 are now large trees. This species of Oak is recommended by the University for planting in all parts of California. The Cork Oak has been distributed for the past two seasons, and reports indicate its adaptation to a very large area, but more especially to the foothills of the Sierra Nevada.

The growth of the Wild Cherry (*Prunus serotina*) and of the Box Elder (*Negundo aceroides*) has been all that could be desired, but the two Hickories tested, *Hicoria glabra* and *H. alba*, have been extremely slow, and will not pay to plant here. A Japanese tree, the *Zelkowa Keaki*, makes a fine growth.

Since 1880 the work of the University gardens has been broadened in many directions. Carob-trees sent out are growing in Napa, Colusa, Los Angeles and other parts of the state. The largest Carob-trees in California are near Los Gatos, on the farm of Mrs. Arnerich, the widow of a Dalmatian who planted seeds in 1873 producing some twenty-five trees, now fifteen feet high, with trunks nine inches through. Trees of equal age, though not so large, are in bearing on the farm of James Shinn, Niles. The Carob seems to be perfectly at home on the California hill-sides.

The yellow Guava, *Psidium pyriferum*, only succeeds in sheltered spots in the southern counties and in the Sierra foothills. *P. Cattleyanum* proves hardy at Berkeley, on the Oakland foot-hills, and in many places throughout the state. The Melon-tree (*Carica Papaya*) failed in most places. At last a small plant was sent to Mrs. Whitney, of National City, San Diego, and in three years it grew to a height of twelve feet, and has borne fruit every season since. The Pistachias, both *Pistachia vera* and *P. Terebinthus*, are being planted in many places. The latter grows rapidly and is hardy; the former is a slow grower, but promises well. The largest in the state are at Niles.

The Camphor, *Camphora officinalis*, is an entire success. On the Hayward estate, San Mateo, are trees forty-five feet high, with trunks three feet in diameter. The Camphor thrives here wherever a Peach or Pear will grow, and hundreds of trees are now planted on every kind of soil. It promises to become one of the great avenue trees of the future. One of the Cinnamons, the *Cinnamomum glaucum*, seems to be as hardy here as the Camphor.

Among the rare Chilian shrubs growing at the University are the handsome-leaved *Boldoa fragrans;* the *Persea lingua*, whose timber is used for cabinet work; the thorny hedge plant, Espino, and the *Psoralea glandulosa*, which is used to some extent for planting on drifting sands. The Acacia that has been most widely distributed is the *A. decurrens*, or Black Wattle, which proves of rapid and easy growth from Shasta south. *A. dealbata* and *A. melanoxylon* are equally fast growers. The only possible objection to the Acacias is that the forests are liable to become infested with the Cottony scale. Mr. Klee tells me that since the introduction of the Australian Lady-bird, which feeds on the Cottony scale, he considers all danger to the Acacias from this source over, and thinks they cannot be recommended too highly. The famous Jarrah, *Eucalyptus marginatus*, is hardy in many places about Berkeley.

Of Olives, two valuable varieties introduced by the University from Spain are the Manzanillo and the Nevadillo Blanco. They have been widely distributed, the latter proving the most vigorous grower of any Olive yet in the state, although perhaps not so hardy as some others. A number of varieties of Mulberries, including the best Japanese, have been distributed at the various stations. They have done remarkably well. At Paso Robles they have resisted the hot and dry weather better than any other deciduous trees.

The Huasco raisin Grape, from Chili, has been distributed widely, and during the last two years has fruited in many parts of California. In appearance it seems impossible to distinguish it from the Muscat of Alexandria, but it shows less tendency to "coulure" in localities where this is caused by the northers, and hence may prove more valuable in certain regions.

Of new hardy Palms, the *Erythea edulis* is an attractive Pacific Coast species, similar in growth to the *Washingtonia filifera*, of a darker green, and without filaments. It has proved as good a grower and fully as hardy, having fruited for the past two seasons at Berkeley. The Chilian Coquito (*Jubæa spectabilis*) is much like the true Date Palm in appearance, but is of a more robust habit, and a darker green. It is also hardy here, and exhibits in Berkeley fully as good a

growth as the Date. The *Acacia Arabica*, one of the sources of gum arabic, was grown from seeds imported from India, and was distributed both in the form of seed and plants. The only place where it survived the severe winter of 1887-'88 was on the mesa land of San Diego County.

The New Zealand Flax, *Phormium tenax*, has been distributed throughout the state, and finds great favor with many gardeners for tying purposes. It does not thrive in the hot interior valleys, but in the Coast Range-region it is an entire success. In fact, I have seen it growing in cañons where roots have been thrown from gardens, and it is likely to become naturalized in some localities.

The University has devoted a good deal of time and money to experiments with new forage plants, medicinal plants adapted to the climate, and new fruits. E. J. Wickson made a valuable report on the grasses and forage plants in 1887, in which he said that this department began in 1879 with about fifty species of grasses, clovers and other plants, and had added all the promising species that could be obtained. The seasons of 1888 and 1889 were "dry years," and the conclusions of the previous years were confirmed. *Sorghum Halepense*, the evergreen millet, needs irrigation, will stand little frost, and has generally proved disappointing. Two Brome grasses, *Ceratochloa unuloides* and *Bromus inermis*, have been widely distributed with great success on hill lands. Of the Australian Salt Bushes recommended by Baron Von Mueller, *Atriplex vesicarium* and *A. nummularium*, the latter proves superior. It grows on salt marshes and affords much fodder. The Tegasate of the Azores, *Cytisus proliferus*, is a very pretty shrub, six to ten feet high, but its value for live stock is as yet unsettled.

The native grasses, clovers and forage plants of the Pacific coast are being tested under cultivation as fast as they can be collected. This is probably the most promising field at present. Only the old pioneers, who remember California and Oregon as they were when first settled, can form any idea of the waste wealth of pasturage. Intelligent cultivation ought to restore the worn-out hill pastures of this region. In the years following a great rainfall, such as the present winter, species of native grasses and flowering plants that one seldom sees are abundant on the California hill-sides. The coming summer will afford an excellent opportunity to secure seeds and roots.

Niles, Cal. *Charles H. Shinn.*

Viburnum pubescens.

Viburnum pubescens, figured on page 125, is one of the handsome North American shrubs which is not at all new from the point of view of science, but about which gardeners know very little, and no portrait of it has been published before except a small figure in a Danish scientific periodical practically inaccessible to the great majority of students. *Viburnum pubescens* is, nevertheless, one of the best garden plants of its class. It is a compact shrub, growing in cultivation to the height of three feet or a little more, with rigid, erect branches covered with bright colored, reddish brown bark. The leaves are ovate, taper pointed, remotely and sharply serrate, except near the base; they are conspicuously pinnate-veined, two to three inches long, an inch or so broad, and are borne on short, broad petioles. They are covered, on the under surface, as are the young shoots, with a short and very soft pubescence; and in the autumn they turn to a peculiar dark and very rich purple color. The small flat cymes of white flowers, produced in great profusion, unfold in June, and quite cover the upper branches of well cultivated plants. The fruit ripens early, in September or even in August sometimes; it is very dark purple or nearly black. The drupe is oval, a third of an inch long, and slightly flattened before it is fully grown. The seed is slightly furrowed on the two faces with narrowly incurved margins.

Viburnum pubescens is widely distributed from Lower Canada to the Saskatchewan country; it is rather common in northern New England, extends westward to Illinois, and has been found as far south as Stone Mountain, in Georgia. It is rare at the south, however, and is a real northern plant. It resembles in general habit the better known *V. dentatum*, except that it is smaller in all its parts; and it was formerly considered a pubescent variety of that plant, from which, however, it is now distinguished by its flat drupes and seeds and by its short-petioled or nearly sessile leaves. The fruit, too, is much darker colored, and it ripens earlier, while the color which the foliage assumes in autumn is entirely different from that of all our other Viburnums.

The autumn coloring of the leaves of this Viburnum constitutes its principal value as a garden plant, and makes it a very desirable addition to the shrubbery, where the unique tints it assumes in October make it always a most conspicuous and interesting object. *C. S. S.*

Foreign Correspondence.

London Letter.

Fragrance in Ferns has lately been the subject of much discussion in the London papers, largely by people who appear to know little about it. We have not yet reached the point of starting a limited liability company to turn this property in Ferns to profitable account, although leader-writers in some of the morning papers evidently think there is a "good thing" in this—to them—new discovery. At a meeting of the London Botanic Society, the Secretary drew attention to the strong, hay-like odor of a Fern which he called *Polypodium Wildenovii*, but which afterward proved to be the commonly grown *P. Phymatodes*, the fragrance of which is well known to pteridologists. The odor is emitted by the fronds of this species when they are partially dried, and even after they have been dried for years. A few of the fronds, when placed in a room, impart to it a very pleasant, hay-like odor; or they may be used for placing among linen, etc. The plant itself is not in the slightest degree fragrant; it is only after the leaves have begun to "flag" that the odor is developed. There are several other species of Polypodium belonging to the same section as Phymatodes which also possess this peculiar character. They are employed by the South Sea Islanders and by the Maories in New Zealand to scent oils and various foods. It is possible they may prove of some economic value here; at any rate they may be used in preparing *pot-pourri*.

Other fragrant Ferns known here are *Dicksonia punctiloba* and *Nephrodium fragrans*, both natives of North America and both sweetly scented, the latter resembling Primroses in its odor. Then in England we have *N. æmulum*, called also *N. Fœnisecii*, or "hay cutter," on account of its hay-like odor, and *N. montanum*, which smells like lemons. Another fragrant Nephrodium and a well known greenhouse Fern here is *N. patens*, the fronds of which when bruised emit a strong odor like that of ripe apples.

Although not fragrant, yet deserving of mention because of its strong and peculiar odor, is a variety of *Anamia Phyllitidis*, a common Fern in South America and the West Indies. As a rule this species is odorless, but I am informed that in Jamaica a variety occurs with a strong and very disagreeable odor. The development of this character in only a small proportion of the plants of a species is very remarkable. There is absolutely no other character by which the variety here called Fœtida can be distinguished from the type, except that of odor.

Seeds of Sugar Cane.—Two years ago attention was called to the question of how far it was possible to improve on the saccharine qualities of the Sugar Cane by other means than selection from bud variation, the plan invariably adopted by cultivators of this plant. It was then stated that "owing to the power of producing fertile seeds having apparently been lost by the Sugar Cane, it was impracticable to deal with it by means of cross-fertilization or by the ordinary course of seminal selection." This statement now proves to be incorrect, seeds and seedlings having been produced by Sugar Canes in Dodd's Botanical Station at Barbadoes. A quantity of the seeds have lately been received at Kew, and young plants raised from them. Apparently, therefore, the Sugar Cane still possesses the power to flower and mature seeds if placed under conditions favorable to its doing so. The importance of this discovery cannot easily be exaggerated, and there is now a hopeful prospect of a considerable improvement being made in the sugar-yielding qualities of the Sugar Cane, which, if realized, will strengthen the producers of cane-sugar against those of beet-sugar. That variation does actually occur amongst plants raised from seeds is proved by a letter from Mr. J. B. Harrison, of Barbadoes, to the Director of Kew (See *Kew Bulletin*, December, 1888, p. 294), in which he states that "sixty [seedling] plants were successfully transplanted and are being cultivated. At present they are not far enough advanced in their growth to speak with

certainty, but there appear to be amongst them several different kinds, probably five or six at least." A description of these six seedling varieties has lately been published in the Demerara *Garden, Field and Forest*, and they are spoken of as very promising. The Director of Kew has recommended the whole subject to the consideration of the Colonial government, suggesting that experimental cultures of the Sugar Cane should at once be started in Demerara, Jamaica and other sugar-producing colonies. The belief that the Sugar Cane never produced seeds also exists with respect to several other cultivated plants, two of them being natives of New Zealand, namely, *Convolvulus chrysorrhizus*, the Kumara of the Maories, the tubers of which are a staple food with them, and the Ti plant, a species of Cordyline. The former plant used to be in cultivation at Kew, and one year it produced tubers which were quite as good as Parsnips, when cooked. They are, however, difficult to keep through the winter, and they were consequently lost.

Fig. 26.—Viburnum pubescens.—See page 124.

Fruit and Vegetables in the London Market.—A few notes on these at the present critical season of the year may be of interest to some of your readers for purposes of comparison. With regard to fruit the supply is unusually poor, even for February. Pears are not to be had, while apples are rather scarce, what we have being either American or French, a few only being English, principally of Dumelow's Seedling, an Apple of first-rate quality and usually plentiful at this time of year. It and Bramley's Seedling, a very similar kind, are placed in the first rank and strongly recommended for orchard planting, the last named being spoken of by one of our first authorities, Mr. Wright, as superior to most of the apples grown for the English market. The French apples in the market now are remarkable for their bright, attractive colors, and they fetch about from twelve to sixteen shillings per hundred-weight, wholesale. The American samples vary in quality, the poorest selling for twelve shillings, the best for about twenty-five shillings per barrel. They are chiefly Greenings and Russets, the latter commanding the highest prices. Good grapes sell for as much as five shillings per pound. Oranges are abundant and cheap. Pecan-nuts from America have lately appeared in the London shops, and they promise to become almost if not quite as popular as their allies, the Walnuts. They are, however, not yet much known. The Shell-bark Hickory-nut also has been tried, but it is a very inferior nut and scarcely likely to find favor here.

Vegetables are abundant and good, the mildness of the winter having been in the favor of growers, although the abundance tends to keep the prices exceptionally low. We have still Brussels Sprouts; Broccoli, chiefly from Cornwall, is plentiful and sells for about five shillings per crate. Kale and Sprouting Broccoli are also good and cheap, the last named being obtainable for one shilling per sack, the price of Turnip-tops, a popular vegetable here with the poorer classes. Savoys, bunched greens and Spinach are almost given away, the last named not commanding more than one shilling six pence per bushel. Potatoes are mostly of the following kinds: Beauty of Hebron, an excellent potato both for early and late purposes; Magnum Bonum, Early Rose, Regents, Scotch Champion and Imperator. These are more or less abundant, and vary in price according to quality from forty to seventy-five shillings per ton, a few specially good samples of Magnum

Bonum and Beauty of Hebron fetching as much as ninety-five shillings per ton. Asparagus fetches from eight to ten shillings per bundle of one hundred sticks. Tomatoes are now received from the Canary Islands in considerable quantities, and these are cheap enough and of sufficiently good quality to destroy the market for English grown fruit, which, a little while ago, sold for high prices at this time of year. Now, however, it is possible here to get a dish of tomatoes for six pence per pound retail. Except where otherwise stated all the prices here quoted are wholesale. I am indebted for most of the particulars here given to a paper by Mr. Shirley Hibberd in the *Gardeners' Magazine* of to-day.

London, February 22d. *W. Watson.*

Cultural Department.

The Cucumber.

THIS is a much more interesting study in a botanical sense than the Watermelon, and has a greater climate range than the Watermelon or Cantaloupe. It is eaten young as a pickle, older as a salad, and may be cooked at maturity like a squash. Each country appears to have its special varieties, some of which are not edible; others are actually poisonous, and others again are eaten with relish undressed.

The fruits vary in length from less than two inches to six feet, and from an ounce to twenty pounds in weight. Their prevailing color is green; but there are also white, yellow, pearl color with green stripes, and striped green and white varieties. In form they are straight, curved, tortuous, cylindrical and prismatic; with smooth, hairy, prickly, spinous and knobbed surfaces. Some are full of spines when quite young, and others like a hairy caterpillar; but both kinds become smooth as they mature.

Hairy Cucumbers are the favorites of Egypt and Syria, where they are eaten in vast quantities, as our people eat apples, without any preparation or even paring. In India they are used for pickling. We have tested two varieties from Cairo, and one from Beirut. One of the Cairo varieties is long, drupe-shaped, of a delicate pearl green tint, and has ten bright green lines running from end to end in shallow grooves; it is a beautiful looking fruit. The leaves of the plant are three-lobed and of small size; the fruit is known in Egypt as the Quaté. The other Cairo variety bears a curved fruit of much less attractive appearance, and the leaf is scallop-edged. The Syrian hairy Cucumber is known by the native name of Mukte, and is considered the best in Palestine, where they grow also pure white fruits, and green ones that turn lemon-yellow at maturity. The Mukte somewhat resembles the Quaté, but has the green lines only at the ends; its leaves are of the form of a Palm-leaf fan, and the plant looks more like a Cantaloupe than a Cucumber-vine. The natives eat this cucumber in quantities, skin and all, and American residents claim that it is much more wholesome than any of our varieties; when grown climbing it is a beautiful fruit, but is apt to grow hollow in our soil and climate.

The reticulated Cucumber has within a few years become well known by its sponges, sent as a commercial product in bales from Japan and Egypt. The first sold here was the product of the wild variety of Cuba, which grows very small in that island, but larger in Florida and in this city. The Cuba sponge is very fine in texture and only about eight inches long; it is used by Florida ladies for washing their hands.

The Chinese and Japanese have the largest of the Cucumber family, the fruits being very thick in proportion to their length. Seeds of the Chinese variety were sent to me under the name of a long, green Squash, by a correspondent at Foochow. I at once found that the fruit could not be a Squash, and was curious to find out what the peculiarly formed seeds would produce. The plant proved to be a Cucumber-vine of large proportions, having a leaf like that of the White Spine, but larger. The fruit is large and green, and would be taken for a Squash, which it tastes somewhat like when cooked; it hybridizes readily with our Cucumber, which ruins the product of the seed.

The *Benincasa cerifera* of India is an intermediate in character between the large Chinese Cucumber and a Watermelon. The vine is somewhat like that of a Squash, and the young fruits are covered with hairs; the seeds are white, very light in weight and abundant. The fruit looks like a Watermelon covered with a white coating like the bloom upon a blue plum, but much thicker; it is sometimes called the "Waxed Squash" and is prepared for the table by stewing; the seeds are much more like those of a watermelon than of a squash. The fruit has been grown at Reedland Farm, New Jersey, and bears our climate well; I do not know that it has been cooked in this country; in India it is served at weddings.

Prompted by a remark made by an Armeno-Turkish lady, I sent to Constantinople and obtained in 1883 the seeds of a green cucumber, to which I gave the name of the "Pera," and which I believe to be the largest and finest flavored variety ever introduced into America; and this appears to be the opinion generally held in regard to it. I also obtained seeds of the White Cucumber of Palestine, and the prolific Green Cucumber of Malatiyeh, in the valley of the Euphrates, both of which were fully tested, and the former of which is considered a valuable acquisition for quality and productiveness. —*From an address before the Pennsylvania Horticultural Society by Robert T. Harris, M.D.*

Wire-Netting in the Kitchen-Garden.

PEAS, Climbing Beans and Tomatoes are all better for some support, and with most village-gardeners Bean-poles and Pea-brush cost money and trouble. At best, the brush and poles are unsightly. Some months ago I recommended the use of the galvanized wire-netting, now sold so cheaply for this purpose, and I have just seen the suggestion ridiculed in an agricultural paper as a device for millionaires. Now the fact is, that the galvanized wire-netting, sufficient for a row of Peas, Beans or Tomatoes 150 feet long, will cost twenty cents a year if ordinary care is taken with the netting when not in use. To go into the country, cut and haul brush enough for such a row would cost the average town gardener five times as much at least. In fact, I believe that in a farmer's garden even it will be more economical to use the wire than to take time to cut and haul the brush. In using the wire only a few stout stakes are needed, which can be put away under cover when not in use, and it makes the neatest kind of a trellis imaginable. It throws no shade and always presents a point to tie to. Tomatoes usually need a good deal of tying with most methods of training, but on the wire-netting they soon get their shoots interlocked in the meshes and only need the occasional tying in of a branch. This netting is not only cheaper than the various patent trellises offered for sale, but is much better every way. The netting is largely used for poultry-yard enclosures. A wider grade is used, so as to make a fence seven feet high by the help of a base-board twelve inches wide. There is no reason why these poultry-yard fences could not be made both beautiful and useful by using them to support Grape-vines, trained high, so as to have the fruit out of the way of the poultry. The vines would be benefited by the dropping of the fowls, and the fowls by the shade of the vines. I have often thought the hideous wire fences, which are now getting so common, could be made more useful as fences and at the same time yield a revenue by planting some of the improved Blackberries beside them and tying the shoots to the wires. I saw one recently covered with a dense growth of evergreen Honeysuckle, and it was about as pretty a hedge as one would wish to see. One of the beautiful sights of this city is a wire fence dividing two lawns, which is covered with well trained Maréchal Niel Roses. Northward a more hardy Rose could be substituted.

Raleigh, N. C. *W. F. Massey.*

Beaumontia grandiflora.

BEAUMONTIA is a small genus of stout evergreen climbing shrubs with large leathery green leaves and terminal cymes of large, trumpet-shaped, white, fragrant flowers. It belongs to the same natural order as Dipladenia and Allamanda, namely, the Dogbanes, and with them forms a trio of free-flowering stove plants of exceptional size and beauty. But whilst the two last named genera are cultivated in almost every good garden, Beaumontia is scarcely known. The largest flowered species is *B. grandiflora*, and it is to this that we wish to direct special attention now.

It was first introduced into England by Dr. Wallich in 1818 from the Himalaya, where it extends from Nipal to Sikkim, ascending to 4,000 feet elevation. It does not, however, appear to have attracted the attention of horticulturists, and when several of its magnificent clusters of flowers were sent from the garden of Earl Cowper to a meeting of the Royal Horticultural Society, in the spring of 1886, it was almost unknown. Mr. Ruffett, gardener to Earl Cowper, has just forwarded to Kew an exceptionally large cluster of the flowers, and they are so large, so exquisite in form and purity, as well as being very fragrant, that one wishes that every garden possessed the plant which may be made to yield every spring flowers like these. Here is a description of them. Each flower resembles

in form and size the Bermuda Lily; the tube is six inches long, trumpet-shaped, two inches across at the mouth, where there are five spreading segments, each two inches long and one and a half inches wide, reflexed and pointed at the tips. The whole of the corolla is pure shining white, except at the base near the calyx, where it is slightly tinged with green. The calyx is composed of five oblong overlapping lobes, free almost to the base, one and a half inches long, green, tinged with brown. There are four fully expanded flowers, three large buds, and about thirty smaller ones in the single cymose head before me now. The leaves are ten inches long by about four inches broad, Magnolia-like in texture, dark green above, paler and tomentose beneath. The thickness of the stem six inches below the head is a half inch in diameter.

The plant grows very rapidly, and when properly treated it develops all along its main branches lateral branchlets, which, when about eighteen inches long, bear each a head of flowers. I have seen a plant which was growing in a stove, and planted in a fifteen-inch pot, with over a hundred flowers expanded upon it, and all upon a vine not more than twenty feet in length.

CULTURE.—I cannot do better than quote here the cultural directions which Mr. Ruffett sent to me a year or so ago. Speaking of the first small plant he got, he says: "I potted it in a compost of equal parts fibrous loam and peat, with a little silver sand, keeping it in active growth. When it had attained the height of three feet it was planted out at the warm end of a large conservatory, where it grew fairly well for three years, but made no sign of flowering. Feeling assured it required more solar heat to develop its growth, I had it removed to the back wall of a Banana house, which is a span roof resting on a wall ten feet high. It was now a plant considerably over twenty feet high, and in a place that rendered it difficult of access. The consequence was that it was much mutilated in process of removal; so much so that I quite despaired of success in the operation. However, the thing was accomplished, and when a year had gone by it began to make rapid growth, and had to be stopped back to prevent its overgrowing everything.

"The use of the knife was evidently not to its liking, for it still made no sign of flowering. I therefore allowed it a space under the north side of the roof to grow as it liked, and then the tables were turned, and I had my reward for humoring its nature. In the following spring, after one year of free growth only, it made a grand display of flowers, and has continued to do so, the present being the third year of its flowering with me.

"I find it a very free-flowering plant, not requiring a great amount of fire heat, but all the sun-heat and light possible. It is something to know that this magnificent Indian plant is satisfied with our weak sunshine, provided it is left alone to make free growth in its own way."

There are three other species of Beaumontia, and one of them, namely, *B. Jerdoniana*, a native of the Deccan Peninsula, is in cultivation at Kew, and in a few other gardens, notably at Panshanger, where Mr. Ruffett has succeeded in flowering it this year. It is smaller in all its parts than *B. grandiflora*, and although handsome when compared with many other garden Apocynads, it is very second-rate by the side of its congener. The flowers last well when cut and placed in water. They are also suitable flowers for wreaths and bouquets. A wreath formed entirely of the flowers of *B. grandiflora* was one of the most beautiful of the hundreds sent to the funeral of the Duchess of Cambridge about a year ago. The majority of those who saw this wreath mistook the flowers for "elegant and uncommon looking Lilies."

Kew. *W.*

Orchid Note.

Maxillaria lepidata.—Under this name there is a small but vigorous plant now flowering freely in one of the greenhouses at the Harvard Botanic Garden. It is uncommon and interesting. Brown, in his supplement to Johnston's "Gardeners' Dictionary," states that it was introduced from Colombia in 1878. But a species under the same name was known to botanists much earlier. Lindley's description of the latter is as follows: Stemless. Leaves solitary, strap-shaped and very sharply narrowed to a petiole. Peduncle one-flowered, acutely sheathed, erect and half as long as leaf. Sepals long, linear and narrowly pointed. Petals bristly acuminate and half as long as the sepals. Lip fleshy, obovate, three-lobed, keeled at top and chaffy on both sides. Middle lobe ovate; the top and anterior margins of the lateral ones crenate. Tubercule narrow and scarcely reaching the middle of the lip.* Now, the plant under notice differs in one very important particular from that described by Lindley. The latter is stemless, while the former has very apparent pseudo-bulbs, of flattened ellipsoidal form, and from two to three inches high. The solitary leaves are borne on top of pseudo-bulbs. In all other particulars our plant conforms closely to Lindley's. As a garden plant it is very desirable. The principal fault with many species of this genus appears to be that their flowers—borne, as they are, upon short stems—are hidden by the leaves. That, however, cannot be said of this one. The leaves droop over gracefully, and the flowers, being borne at the top of long stems, are

Clermont on the Hudson.—See page 122.

* *Annals of Nat. Hist.*, vol. xv., p. 38; 1845.

seen to full advantage. The flowers are of an orange-yellow color. The sepals are slightly marked with reddish brown at the base, on the outside; and an indistinct shade of the latter color prevails in about two-thirds of their length, measuring from the tip. The column is freely dotted with little brown spots. Delicate markings of the same color appear at the base of the lip, on the under side, and the thick keel is tipped with a conspicuous blotch of darker tone. Both sepals and petals are sometimes curled and twisted in a manner that renders them additionally interesting. As grown here, in a pot, the plant succeeds admirably under the treatment ordinarily accorded *Maxillarias*, and flowers freely during the winter months. Mr. Watson, of Kew, will confer a favor by saying how far this plant resembles any there may be, under the same name, in the Kew collection. Acknowledgment is made to Dr. Watson, of the Harvard Herbarium, for assistance rendered in my inquiries as to the identity of this plant.

Botanic Garden, Cambridge, Mass. *M. Barker.*

The Day Lily of the Desert.

ONE of the most beautiful and characteristic plants of the Desert region of California is the Day Lily (*Hesperocallis undulata*). Its flower-stems rise from one to two feet above the sand, and bear from a few to thirty or more fragrant flowers, in color, I should judge, of a pearly or greenish white, with greenish stripes. I have seen only one in blossom, and that was too far gone to show the genuine tint.

This interesting species is one of the most promising novelties of the present season, not only for its promise of furnishing us with another lovely garden-flower, but also for its probable economic value in the arid regions of the west. It produces a large edible bulb, varying from one to four inches in diameter, nearly round, with firm flesh. The bulb has a pleasant taste, eaten either raw or cooked like onions. Our party of seven have had them cooked at nearly every meal since we first tested their qualities, and in the lack of other vegetables find them acceptable.

The bulb is found from six to eighteen inches below the surface of the sand or fine gravelly soil, in which the plant thrives best, and is usually found resting on moist gravel or a clay subsoil.

It is not rare on the Colorado and Mohave Deserts, and usually blossoms on the Mohave in the month of May. Near the boundary line it bloomed in 1889 as early as February, and was in seed in April. This year only a few plants are found showing as yet any signs of a flower-stem, but a few weeks of warm weather will doubtless bring them forward.

The Indians are said to obtain both food and drink from this plant when crossing the plains. For eighty or a hundred miles along our southern border one may travel at certain seasons without finding water. The traveler is safe, however, if he knows how to search successfully for this important vegetable, and once found he need not fear either hunger or thirst.

Should it prove susceptible of easy cultivation in the arid regions of the west, it will prove a valuable addition to our list of vegetables. It will certainly prove a welcome addition to the garden, if not an acquisition to the farm. *C. R. Orcutt.*

San Diego, Cal.

Clivia (Imantophyllum) cyrtanthiflora.—There are now many splendid hybrid forms of this genus, but it is doubtful if any of these will, for general purposes, prove superior to the subject of this note. And, by the way, this, too, is now classed as a supposed hybrid between *Clivia miniata* and *C. nobilis*, both natives of the Cape of Good Hope. Some years ago *C. cyrtanthiflora* was also regarded as a species from the same part of the world, and it would now be interesting to know why botanists have changed their minds. It is an evergreen bulbous plant that thrives most satisfactorily in an ordinary greenhouse. The pointed, strap-shaped leaves, from one to two feet in length, are arranged in two rows, and they all proceed from the root. The erect scape is almost as long as the leaves, and bears, in the form of an umbel, from twenty-five to thirty cup-shaped flowers, which are from two to three inches long, drooping, and of a bright salmon color; they are produced at various periods throughout the year, in fact, the plant is seldom without flowers, but most freely during the winter months, and their full color and freshness are retained a great while. Established plants seldom require repotting, and they may be grown in a cool greenhouse during summer, when they should be liberally watered; in winter water may be partially withheld, and the temperature should be maintained at about sixty degrees. To increase the stock, divide the old plants after flowering; and in potting use four parts of good rich loam to two of leaf-mould and one of rough charcoal.

Cambridge, Mass. *B.*

Vieusseuxia Pavonia, or, as it was first called, *Iris Pavonia*, is one of those charming old-fashioned plants which has now almost disappeared from gardens. It is a native of the Cape of Good Hope, like the other species of the small genus to which it belongs, is distinguished from Iris by its filaments united into a tube and by its minute interior perianth-segments. It is a greenhouse plant, but requires very little artificial heat, and flowers in February in a temperature running down to forty or forty-five degrees in cold nights. A pan filled with one or two dozen bulbs is an attractive object when the plants are in flower. They have long, grass-like, pendulous foliage, and flower-stems a foot high with wiry Iris-like flowers about the size of silver dollars. The three outer divisions of the perianth are white, with a large, conspicuous blue spot at the base, its margin fringed with purple and marked at the bottom with two bands, the first purple and the second yellow, the whole resembling the eye in the tail-feather of a peacock—a resemblance which caused the adoption of Pavonia as the distinguishing name for the plant. The under side of these divisions of the flowers are beautifully marked with reticulating blue or light purple lines. The Peacock Iris is one of the easiest plants to cultivate successfully. The bulbs multiply rapidly, so that the stock can soon be increased, and the plants had in flower during a considerable part of the winter if they are brought forward successively in different temperatures. It is not easy to explain, therefore, why such a pretty and desirable plant should have become so rare. It was one of the first plants from southern Africa known and cultivated in Europe and several figures of it appear in the botanical and horticultural literature of the last or of the beginning of the present century. Bulbs can be obtained from the bulb-growers of Holland.

Boston. *S.*

Doronicums.—Mr. John Thorpe has done well to call attention to these desirable plants for winter blooming. Some twelve months ago I wrote of the value of *D. Caucasicum* for cutting purposes, and to this should be added *D. plantagineum excelsum*, the flowers of which are often four inches in diameter. Our plants have flowered for the past two months in a house where frost was excluded. In cases where this cool treatment is given the plants do not seem to suffer in any way when planted out in spring, but flower right on through the early summer months if placed in a rich, moist soil. With us *D. Clusii* is not a success, owing to its provoking habit of rotting in the centre, by which the plant is often completely destroyed. This has been our experience during the past two years with *D. Clusii*, both in-doors and in the open ground.

Dianthus latifolius.—There are not many perennial Dianthuses that will flower in four months from sowing the seed, but we sowed a packet of seed of *D. latifolius* about the end of September and the plants began to flower early in the new year. In habit this Dianthus resembles the Sweet William (*D. barbatus*), but the foliage is much broader, and the flowers are an inch across and are produced in clusters on long stems, so that they are very useful for cutting purposes, especially so since the unopened buds expand in water. We know of no Dianthus with flowers of such a brilliant, rich crimson as those of *D. latifolius*. It is a desirable plant where winter flowers are required in quantity.

Passaic, N. J. *E. O. Orpet.*

Italian Onions.—The introduction of this vegetable has been a great boon to all the southern sections of our country, where the varieties usually grown at the north will not make a crop the first season from seed. Since these Onions have come into use there has been a large falling off in the quantity of Onion "sets" used, and the practice of using sets will soon be abandoned, at least with those Onions which produce seed. Those who grow the Italian Onions only from spring-sown seed, however, have no conception of the size they will attain if sown in autumn. How far north fall sowing can be practiced I cannot say, but whenever it is practicable to carry the crop through the winter the autumn is the time for sowing. The Giant Rocca Onion, which is very unsatisfactory from spring-sown seed, attains a size, when sown in fall, which fully justifies its name, and the large Tripoli sorts are immense. Here (latitude thirty-five degrees forty-seven minutes) we sow the seed at any time in October. Northward an earlier sowing would be better, so as to get the roots quite strong before winter. Here bulbs and tops grow all winter, and as the bulbs gain their size before extremely hot weather comes on, they reach a development which we cannot get with other sorts.

For family use and particularly for pickles the little White Queen Onion is unsurpassed. With this variety we can in

this latitude raise two crops in one season. It is best sown in February or March, as it matures very quickly, and a second crop can be sown here last of August and make good bulbs before Christmas.

The Striped Cucumber Beetle.—In my gardening experience of over thirty years I have never found any need for protectors to keep the striped bugs off of Cucumbers, Squashes or Melons. These beetles usually attack the plants when in the seed-leaf state, and seldom do much harm afterward. As soon as the seed-leaves appear the bugs appear also, but a handful of bone flour dusted over each hill will keep them away. One application usually suffices, but if washed off at once a second dusting will be needed. This is not only less trouble than boxing over the hills, but the bone flour is a good fertilizer, and stimulates the growth of the plants, so that they are soon out of reach of the beetles. Devices to protect plants from the weather are useful, but bug protectors are unnecessary, in my judgment. *W. F. Massey.*

College of Agriculture, Raleigh, N. C.

Correspondence.

Park Construction.

To the Editor of Garden and Forest:

Sir.—Every landscape gardener who has had much experience in the creation of parks understands that his work is but half done when he has completed his design. However carefully he may have prepared his plans, detailed specifications and instructions, he knows that the result depends upon the skill of the man who has charge of the construction. It is rarely the case that the designer is allowed to exercise more than an occasional supervision of the work. Having furnished working plans drawn to scale, lists of trees and shrubs, with explanations of all matters that cannot be represented in drawings, his duties are supposed to be finished, and the work of construction begins under the direction of an engineer or a superintendent, who is employed by the park commissioners and is subject to their direction. The designer ought, of course, in all works of importance to supervise the construction, for there is always much that is essential in carrying out details, which can by no possibility be represented on a plan or described in words, but must be directed on the ground by the artist's eye. This, however, at least in the west, is often impossible, or rather impracticable.

Park commissioners in this section, as a rule, are unwilling to incur the expense of such supervision, and having secured the plan, they leave it to the superintendent and the engineers to transfer it to the ground. Not infrequently the work of grading, road making, etc., is let out to a contractor and the tree planting to the man who will do it at the lowest cost. The result in either case is sure to be unsatisfactory, and if it is further complicated by the officious interference of some prominent member of the Commission who has a local reputation as a connoisseur in art, it is probable that a large amount of money will be wasted on artificial decorations, which are utterly incongruous and destructive of the effects of the original design.

There is but one way in which the work can be satisfactorily performed, and the all-important person to ensure such performance is the park superintendent. I speak confidently on this point, from having in repeated instances witnessed the worse than useless expenditure of large sums in the effort to economize by dispensing with the services of a skilled superintendent, or by employing an incompetent man because he could be had at a low price.

It is all-important in the first place that the superintendent should be a manager of men and able to work them advantageously; for otherwise thousands of dollars may be wasted in loss of time or inefficient work. Where hundreds of teams are employed, a load or two more or less in a day's work of each one becomes a matter of hundreds of dollars before the week is out. And so of every item of the work performed. These are the costly leaks. A competent man will secure from every employee the full amount of his labor, and without any appearance of needless crowding. But this is only one of the essential qualifications of a superintendent. He must be sufficiently familiar with park construction to appreciate the general effects intended by the design, and in directing the work of grading and road making, as well as in planting or removing trees, opening up woods, etc., he must work with steady and intelligent purpose to develop these ideas. He must know enough of soils and of tree planting to see to it that all newly graded ground is provided with sufficient depth of fertile surface soil, and that all such soil, as well as other fertilizing material, is preserved, and that the trees after being properly planted are properly cared for. He will of course employ tree planters and gardeners, but he must himself be sufficiently skilled in the practice to know when each operation is thoroughly performed.

It is plain from these considerations that a capable superintendent may save to a city in a single week more than the difference between his year's salary and that of an incompetent man; and yet it is almost invariably the case that a board of park commissioners is beset by candidates who are ready to work for a low salary, and such a man is often selected from fear that they will be charged with extravagance if they employ a man who knows his business and demands what his work is worth. In the course of forty years' experience as a landscape-gardener, I have had such repeated evidence of the "penny wise, pound foolish" policy of employing cheap men, and such opportunity of enjoying the results of a wiser course of action, that I take this method of presenting the matter for the consideration of every one who is interested in parks and their construction. *H. W. S. Cleveland.*

Minneapolis.

A Northern Station for Quercus lyrata.

To the Editor of Garden and Forest:

Sir.—On the 13th of September last, while gunning in the bottoms of the Patuxent River, about three miles below (east of) Laurel, Maryland, I was surprised to find myself confronted by an old acquaintance in several trees of *Quercus lyrata*. The tree was rather common there, growing along the banks of shallow "sloughs" and in other wet situations, the trees associated with it being *Q. Michauxii*, *Q. bicolor*, *Ulmus Americana*, *Liquidambar Styraciflua*, and several others which thrive best in wet locations, with *Fagus ferruginea* in the immediate vicinity. While the *Q. lyrata* was fairly common, it was of small size, none of the trees much, if any, exceeding thirty or forty feet in height.

Before finding this species, I had been struck with the exceedingly close resemblance between the tree growth of the locality and that of our western bottom-lands, there being but three species (*Quercus Phellos*, common, and *Ilex opaca* and *Juniperus Virginiana*, rare) among the twenty-three species growing there which were not common to the two regions! Of course many western types, or those which are more common west (as Tilia, Æsculus, Negundo, Gymnocladus, Gleditschia, Cercis, Catalpa, Celtis, Juglans, Populus), were wanting, but the general facies of the silva and manner of growth were exceedingly similar, Asimina, Liquidambar and Liriodendron being very common.

It is interesting to note that this station of *Quercus lyrata* is almost exactly on the same parallel of latitude (near thirty-nine degrees) as the locality where I found it in the summer of 1888 in southern Illinois (bottoms of the Embarras River, Jasper County).

The note in a late number of Garden and Forest on the occurrence of Tillandsia in northern Tennessee reminds me that in the summer of 1880 or 1881 I found this plant on the eastern shore of Virginia, about midway between Cherrystone and Cobb's Island landing. It was not plentiful, but I found several tresses of it hanging from the large Pine-trees (*Pinus Tæda*) and Hollies (*Ilex opaca*), by or near the road-side. This, I believe, is its most northern station on the Atlantic coast. *Robert Ridgway.*

Washington, D. C.

American Oaks in Belgium.

To the Editor of Garden and Forest:

Sir.—American Oaks have been introduced into Belgium comparatively recently. The oldest in the country are hardly more than a hundred years old. They thrive here admirably, however, and grow with astonishing rapidity in a light, sandy soil with a rather moist subsoil, the annual shoots often exceeding four feet in length. The Belgian government has of late years devoted a great deal of attention to plantations of trees along the highways. Our Elm (*Ulmus campestris*) injures crops in the neighborhood of the highways with its long superficial roots, and on this account has been largely abandoned in highway plantations; and where the soil is adapted to them, the Red and Spanish Oaks have been largely planted. In the province of Limbourg, where the soil is suited to them, thousands of these two trees have been used with the greatest success. The growth of the Red Oak

is marvelous. Trees only forty-five years old have an average trunk circumference at three feet from the ground of five feet eleven inches, and an average height of more than sixty feet. The actual money value of these trees is from six to eight dollars. In another plantation made in 1845 the trunks have an average of four feet eleven inches, and in still another made as late as 1852 they have an average trunk circumference of five feet three inches. If the development of the Red Oak continues to be as satisfactory in the future as it has been, we shall be able to show in Belgium trees at least three and a half feet in diameter and nearly one hundred feet tall.

The density of the wood of *Quercus rubra*, as compared with our native Oak, *Quercus Robur*, is: *Q. rubra*, 391; *Q. Robur*, 377. The comparison of these two totals shows that the wood of the American species is harder than that of the European. In the trials which have been made to determine the value of the wood of the American tree grown here, in carriage-building and in cabinet-making, its great value has been amply demonstrated. Where the native Oak remains dwarfed and stunted owing to a soil too light for its best development, the Red Oak grows with luxuriance; and its introduction into those parts of Belgium where the soil is light and sandy is a benefit which all land-holders now recognize; and it appears evident that in a few years the American Oak will have replaced the native species in many parts of the country.

Quercus palustris seems destined, like the Red Oak, to be a very useful tree here. There are plantations in this country already sixty years old, containing trees with trunks more than six feet in circumference. It appears, therefore, that this species grows more rapidly even than the Red Oak; and it is noticed that the trunk rises more rapidly than the trunks of other American Oaks. There are some beautiful plantations of this tree along the highways of Limbourg, admirable examples of luxuriant vegetation and promising the best results for the future. It is now proposed by the government to make trials with *Quercus tinctoria* and *Quercus Phellos*. Possibly these facts, the result of experiments in a foreign country, may have some interest for the American readers of your journal.

Mons, Belgium. *Alfred Wesmael.*

The Waverly Oaks.

To the Editor of Garden and Forest:

Sir.—I have read, with much interest, the editorial in Garden and Forest for February 19th, upon the Waverly Oaks. I have met with no such interesting group of Oaks as these. Their location so near the picturesque cascade of Beaver Brook, and upon a supposed local terminal moraine, their grand proportions, their undoubted great age—all about them is worthy of marked attention. It seems to me that their destruction would be an act of vandalism. The suggestion which you emphasize, that the trees should be preserved by setting apart the ground containing them as a public park, is certainly a wise one; and if the park could include the "Cascade" with the glade below it, together, it would be one of the choicest bits of public ground in the vicinity of Boston.

It may not be inappropriate to quote the dimensions of a few White Oaks in Rhode Island, from data which I made and published ten years ago. One of these is on the Owen farm, in Pawtucket, in an open lot on the Power Road from Providence to Pawtucket. The tree has had opportunity for development in the open ground for a century or more, and it is noticeable for its great spread of ninety feet across. The six lower limbs are thrust out nearly parallel to the slope of the ground, and one of them is fifty feet long. The supporting power of these massive members must be enormous. The body is small in proportion to the size of the tree, being only nine feet in circumference at four feet from the ground.

Another remarkable tree stands just over the state line in Massachusetts at Munro's Tavern. In 1858 its circumference, three feet from the bottom, was sixteen feet three inches. There is a tradition, which seems authentic, that a company of soldiers, returning from service, camped about the trunk of this tree and spent the night under its protection. The Catholic Oak, at Lonsdale, girthed, in 1878, fourteen feet at four feet from the ground.

Providence, R. I. *L. W. Russell.*

Prairie Forestry.

To the Editor of Garden and Forest:

Sir.—In a recent number of Garden and Forest appeared an article in which the writer held, very properly, that tree-planting is not forestry. And yet, in the vast prairie regions of the country, where the need of forests is more apparent, though not so great in reality, as among the mountains, the sources whence all our great rivers flow, forestry must mean tree-planting for many years to come. To the people of the western prairies—the Dakotas, Nebraska, Kansas, Iowa and western Minnesota—the word forestry has become synonymous with tree-planting, and conveys no other meaning. It is indeed fortunate that this is so. The prairies can never know the primitive meaning of the word forestry until they cease to be wind-swept. Every year the treeless belt becomes narrower, through constant planting on its eastern border; and while it is true that the prairies will never be forested by the individual enterprise of the farmer, it is equally true that the whole aspect of the west has been changed within the past twenty years. Planted trees have clothed the naked landscape, and homes have been sheltered and the growth of fruit made possible. In crossing the state of Iowa from Dubuque to Sioux City the traveler sees a wonderful example of what forestry means on the prairies. In the eastern part of the state native woods abound along the streams, but after leaving the valley of the Cedar, plantations become a feature of the landscape. Every house seems embowered in trees, suggesting shelter and comfort for the inmates. Farther west these groves decrease in size and number until, beyond the Des Moines River, the prairies are almost as bare as they are in central Dakota. Every year the groves increase in number and in size, and if prairie foresters in Iowa continue to plant trees in the next decade as in the past, the state will have almost genuine forest conditions. It will at least have solved for its open prairies the difficult problem of protection from wind, and they may do much toward eliminating the disastrous droughts that have been such a burden to agriculture during recent years.

Brookings, S. D. *Chas. A. Keffer.*

Populus certinensis.

To the Editor of Garden and Forest:

Sir.—Under this name we received from the Arnold Arboretum, a number of years ago, cuttings of a Poplar which promises to be very valuable on the high, dry prairies of the north-west and west, as it maintains perfect health of foliage and makes a clean, rapid, upright growth where the Cottonwood and other native trees of the bottom-lands of our streams utterly fail to live. I speak of it at this time, hoping to discover the origin of this name. I do not find it in Koch's "Dendrologie" or in any other work in our libraries, and it appears to be identical with, or very closely related to, *Populus Petrovsky*, as sent us by Director Arnold, of Moscow. It also appears to be very closely related to the species known in Russia as *Populus Wobsky*. As this tree has come to stay in the west, I am anxious to determine its origin and its correct name.

Ames, Iowa. *J. L. Budd.*

Periodical Literature.

THE February issue of the Kew *Bulletin of Miscellaneous Information* contains an article on the *Manufacture of Quinine in India*, in which the new oil process for manufacturing sulphate of quinine is explained. The success of this process is a matter of some importance, for if Cinchona-alkaloids can be cheaply extracted from the bark at the place where it is grown, a great saving will be made in the cost of transportation to Europe and America. Mr. C. H. Wood, late government quinologist to the government of Bengal, in an appendix to this paper, sums up the chief advantages of preparing quinine in this manner as follows: "First, the alkaloids are completely extracted from the bark in a much greater state of purity, so that the final operations for obtaining pure and finished products are much simplified. Second, that the whole process of extraction can be performed at common temperatures. Third, that the apparatus and appliances required are all of a simple character and are well suited for use on the plantations."

The low price of Cinchona-bark, quinine and other Cinchona-alkaloids is explained by the immense exportation of bark from Ceylon. It is only a few years, comparatively, since the Cinchona-tree was first introduced into Asia through the efforts of the British government, but the quinine raised in the government plantations of Ceylon, India and Java already far exceeds the amount produced in the native forests of the Andes; and therefore regulates the price of the product.

The introduction and cultivation of the Cinchona in Asia is one of the most triumphant agricultural successes the world has ever seen, so far as the consumers of quinine are

concerned. Overproduction, however, has had the natural results with the planters, and quinine is now sold in London at prices considerably below the cost of production. This is due principally to the state of affairs in Ceylon, where the Cinchona was planted in immense quantities to replace the Coffee-tree, long the stable product of the island, when the coffee crop began to fail from the fungoid disease which attacked the trees. Then the Cinchona failed there to a certain extent, and the planters turned their attention to tea-planting, cutting down the Cinchona-trees by wholesale and throwing the bark on the market in immense quantities, and with fatal results so far as the price of the commodity was concerned. This state of things, however, sooner or later will correct itself, and the world owes a debt of gratitude to the authorities of Kew, through whose instrumentality the Cinchona-tree was first successfully transported from the new world to the old, for this successful piece of work, a good example of the practical value of a great scientific establishment of this character.

There are papers, too, on the use of the berries of the Maqui (*Aristotelia Maqui*) in coloring wine. The Maqui is a small evergreen tree or shrub, which is common in the mountain regions of Chili, belonging to the same family as the Lindens, and with the same fibrous inner bark. Maqui berries are eaten in Chili either fresh or preserved, and mixed with grapes are made into wine. Of recent years they have been collected and exported to Europe in very large quantities for the purpose of coloring wine. This industry seems to be growing rapidly. In 1884, 26,592 kilos of the dried berries were sent to France, while in 1887 the quantity had increased to 315,774 kilos. The berries are used in the same way and for the same purpose as Elder-berries have been used in France. The present issue of the *Bulletin* contains also shorter articles on *Vine Culture in Tunis*, on the *Phylloxera in Victoria*, on Baron Eggers' *Botanical Exploration of Cuba*, and a statistical article on the sugar production of the world, which, among other things, shows that for a period covered by the years 1853–1887, out of a total increase of production amounting to three and three and a quarter millions of tons, no less than two and a quarter millions of tons, or about sixty per cent., is an increase of beet-sugar, which has now changed its position as a factor in the production, having reached the point of being nearly equal to cane-sugar, whereas at the beginning of the period it supplied only one-eighth of the total production. The production of both British cane-sugar and foreign cane-sugar has more than doubled in the same period.

Bibliography.

A List of Works on the Art of Landscape-Gardening.

THE following list of works treating of landscape-gardening which have been published in English, French, German and Italian since 1625, the date of Bacon's classical essay, has been prepared in the library of the British Museum, in the Bibliothèque Nationale and in other public and private libraries, and is as complete as I have been able to make it. I have endeavored to include all books, pamphlets, articles and reviews except those which have appeared in horticultural and agricultural papers. Such a work is necessarily liable to error, and I shall be glad of any suggestions or corrections which will help to make the list more complete and correct.

Those books which seem to have a special interest are marked with a star.

Henry Sargent Codman.

Brookline, Mass., Feb. 1st, 1890.

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1665. RENÉ RAPIN.—"Rapini Hortorum libri iv., et disputatio de cultura hortensi." Paris, 4to. French trans., "Les Jardins, poeme latine en quatre chants," by Voyron and Gabiot, Amsterdam, 1782, 8vo. English trans. by John Evelyn, London, 1673, 8vo. Another by James Gardiner, London, 1716, 8vo.

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Notes.

Eucharis Bakeriana is a new species which has recently flowered in England in the St. Albans nursery, and which has been named by Mr. Sander in compliment to Mr. Baker, of Kew. It has the foliage of *E. Amazonica* and flowers as large as those of *E. candida;* it differs from all other species in having a conspicuous trumpet-like corona, as in the Daffodils. As a decorative plant it is the equal of *E. candida.*

The first cost of stocking a Narcissus-farm in the Scilly Islands is almost prohibitory except to a capitalist. The roots can be had for ten dollars a thousand, but a single acre will easily swallow up a million roots. Ten thousand dollars for stocking one acre seems like an expensive plant, but the increase is such that three acres can be planted the third year, and so long as the demand for the flowers lasts this will prove a lucrative investment.

The market gardeners of the south, particularly those about Mobile, have suffered seriously this year from injuries inflicted by the cut-worm. Truck farmers were obliged to employ a force of men to begin work at early dawn to search for the destroyers and to set out new plants where the young Cabbages had been cut off. The farmers attribute the great increase in the number of various pests to the extermination of insectivorous birds by pot-hunters, and by boys and others who shoot them out of mere wantonness.

Successful experiments have been made in Austria for the conversion of corn-husks into paper and cloth. The husks are boiled in an alkali until the fibres are reduced to a spongy condition. The glutine is then pressed from the fibre, which remains as a mass of chain-like, long threads, interspersed with shorter ones. The long fibres are woven into a good quality of coarse cloth, similar to that made from the lower grades of flax and hemp; and the short ones make an excellent paper, very strong, and hard and firm in grain.

The Cornelian Cherry (*Cornus mascula*) of Europe is now lighting up the shrub-borders of Central Park with its golden bloom. It is surprising that so good a shrub or small tree is planted so little in this country. It should have a place wherever spring flowers are admired, for it never fails to bloom profusely. Later on, when in full foliage, and in late August, when its cornelian-colored, cherry-like fruits are fully ripe, it is a most attractive object. Up to the present time, moreover, it has escaped the ravages of the destructive larvæ of the Cornel Saw-fly, which was described and figured in vol. ii., page 520 of this journal.

Beyond Boma, according to Mr. Tisdel's interesting account of the Congo Basin in the *Century Magazine*, there is nothing at all in the valley of the Congo wherein he traveled which one could describe as a forest in any particular. While one does find some large trees, they are few, and principally Mangroves. Nothing indicates that there ever has been a growth of timber. In the first place the soil is not of sufficient depth or richness to produce timber or even to produce anything. About the only thing that grows along the valley is wild grass, sometimes ten, twelve, fifteen and even twenty feet high; and throughout the whole country are zigzag paths made by the natives and utilized by the caravans.

Harpers' Weekly for February 22d gives an illustration of the new gateway for Harvard University, recently built by Messrs. McKim, Mead & White, together with a reproduction of the design as at first proposed. It was noted in these columns about a year ago that this design showed a large central gate of wrought iron, flanked by stretches of wall in which were low, round-headed doors, and beyond these tall iron railings. As now constructed, the walls are solid and plain, and an iron gate, smaller than the central one, is placed beyond them on either side. The change is not an improvement; yet, as it stands, the entrance is both dignified and appropriate, and the treatment of the iron-work is described as particularly artistic and beautiful.

A lady writing from Michigan to the *American Florist* with regard to the rapidity with which bulbs may multiply if undisturbed for a few years, says: "I thought I would take one Gladiolus bulb and ascertain what the increase would be in five years. I selected Madame Monneret, . . . and in the spring of 1886 I planted one small bulb; in the fall of the same year I had one large bulb and over forty bulblets to plant out in the spring of 1887. In the fall of 1887 I had forty small but blooming bulbs, and, by actual count, 500 bulblets. In the fall of 1888 I had 500 small but blooming bulbs, and, by actual count, 4,500 bulblets. In the fall of 1889 I have 500 three-year bulbs, 4,500 two-year bulbs, and the bulblets I have not had the patience to count, but thought 50,000 would be a low estimate. Next year would be five years, and I easily could have 50,000 bulbs if it were not for selling them as soon as they become marketable."

The municipal government of Paris has just purchased the Forestry Pavilion, of which an illustration was given in our issue of January 25th, paying the French Forest Department $17,000 for it, and workmen are already at work preparing to remove the building from the Trocadéro to the Bois de Vincennes, at the other end of Paris. It is pointed out in the *Revue des Eaux et Fôrets* that the city has made a foolish bargain. The pavilion was erected without permanent foundations, which will now have to be provided for it, and these and the cost of removal are estimated at $2,000, making the cost of the building when set up $19,000, which does not include any of the contents, which will have to be provided for in additon, as the Trocadéro exhibit is retained by the Forest Department. The great trouble, however, is not in the cost of the building, but in its temporary character, for it is shown that a building constructed of unseasoned logs, and dependent for its beauty upon the preservation of their bark in the natural state, can last at most only two or three years in a presentable condition.

The milder climate of England means a much earlier spring than ours and the later survival of a multitude of autumnal flowers, so that, in the southern counties at least, there is often not a week in the year when something pretty may not be gathered from the garden. But, on the other hand, our brighter winter skies are far more favorable to plants grown under glass. These facts were commented upon by Mr. Samuel Henshaw in an address recently delivered before the Florists' Club of this city, and the difficulty of forcing Roses in England was especially noted. "All through the middle of the winter," he said, "there is a great scarcity of this flower in England. Even Tea Roses are scarce and poor in quality." Gloire de Dijon Roses and a few varieties of Teas "were exhibited at the spring show in Bristol in March, but were few and very much inferior to what may be seen in any florist's window in the middle of the winter in New York." But in the southern parts of England the Gloire de Dijon "is often seen covering the fronts of cottages and in full bloom in the early part of May."

The production of Sisal hemp in the Bahama Islands is being rapidly developed, arrangements having been perfected lately to plant 10,000 acres with the Sisal under the stimulating influence of an export duty of £4 13s. 4d. per ton, paid by the government, on all Sisal hemp grown on the islands. Sisal hemp is produced from a species of Agave (*A. rigida*, var. *Sisalina*), a native of Yucatan, where it has been cultivated by the natives ever since the country was known to Europeans, and where of late years its cultivation has immensely increased on account of the growing demands in all parts of the world for larger supplies of Hemp than the East Indies have been able to supply. This great increase in the consumption of hemp-fibre may some day or other have an important influence on the agricultural prosperity of Florida. The climate, soil and vegetation of the southern shores and islands of Florida are identical with those of the Bahama Islands, and if Sisal hemp can be produced in those islands, it can be grown of as good quality, if not as cheaply, in south Florida, when it is known that the Sisal plant flourishes, and where it is now naturalized and spread over a considerable surface, it having been one of the useful plants introduced into Florida about fifty years ago by Dr. Perrine, who was employed by the government of the United States to study the economic value of various plants and test their adaptability for naturalization in Florida. He made a careful study of the Sisal in Yucatan, and the results of his investigations were published in Senate Doc. 300, Washington, March 12th, 1838. The principal crops of the Florida keys, of which only a very small part are cultivated at all, are tomatoes, grown to supply the northern markets in winter, and pineapples, which suffer during winters of unusual severity, and are not, so far as quality goes, a satisfactory crop. Extensive plantations of the Cocoanut have been made on the Atlantic coast; but although there are a few large Cocoanut-trees on Key West and near Bay Biscayne which yield fruit, it is doubtful if the climate of south Florida is sufficiently hot to produce cocoanuts which will be able to compete in the market with those grown under the more favorable conditions which prevail in Jamaica, British Honduras and Guatemala. Sisal is, on the whole, the most promising plant with which to experiment in southern Florida; and nothing but the cost of labor and machinery in Florida can interfere with the production of Sisal hemp in competition with that grown in Yucatan or in the Bahama Islands.